

الف) $\frac{6n^2-5n-6}{7}=0 \Rightarrow 6n^2-5n-36=0 \rightarrow \begin{cases} n_1 = 9/6 = 3/2 \\ n_2 = -4/6 = -2/3 \end{cases}$

ب) $\frac{3n^2-8n-3}{3}=0 \Rightarrow n^2-8n-9=0 \rightarrow \begin{cases} n_1 = -1/3 \\ n_2 = 9/3 = 3 \end{cases}$

پ) $\frac{4n^2-4n-3}{4}=0 \Rightarrow n^2-n-12=0 \rightarrow \begin{cases} n_1 = 6/4 = 3/2 \\ n_2 = -2/4 = -1/2 \end{cases}$

ت) $\frac{2n^2-5n-12}{2}=0 \Rightarrow n^2-5n-24=0 \rightarrow \begin{cases} n_1 = 8/2 = 4 \\ n_2 = -3/2 \end{cases}$

الف) $n^2-5n-14=0 \Rightarrow \alpha\beta=-14, \alpha+\beta=-5 \Rightarrow \alpha=7, \beta=-2$

ب) $2n^2+5n+3=0 \rightarrow a+c=b \Rightarrow n_1=-1, n_2=-3/2$

پ) $n^2+2n+3=0, \Delta=b^2-4ac=4-12=-8 \rightarrow \Delta < 0$ ریشه ندارد

ت) $3n^2+3n-2=0$
 $\rightarrow \Delta=9+24=33 \Rightarrow n = \frac{-3 \pm \sqrt{33}}{6} \rightarrow \begin{cases} n_1 = \frac{-3+\sqrt{33}}{6} \\ n_2 = \frac{-3-\sqrt{33}}{6} \end{cases}$

$A=\{1,2,3\}, B=\{2,3\}$

$A \times B - B \times B = \{(1,2), (2,2), (3,2), (1,3), (2,3), (3,3)\} - \{(2,3), (3,2), (3,3), (2,2)\}$

$= \{(1,2), (1,3)\}$

الف) $f(n) = \{(3, n^2), (2, n), (-3, n), (-2, n), (3, n+2), (n, 4)\}$

$n^2=n+2 \Rightarrow n^2-n-2=0 \rightarrow \begin{cases} n=2 \text{ (X)} \\ n=-1 \text{ (✓)} \end{cases}$

ب) $g(n) = \{(3, n^2), (2, n), (n, 4), (3, n+2), (-2, n), (-1, 3)\}$

$n^2=n+2 \Rightarrow \begin{cases} n=2 \text{ (X)} \\ n=-1 \text{ (X)} \end{cases}$

در رابطه قرار نمی‌دهیم پس تابع نمی‌شود.

$f(n) = \{(1, a^2), (1, 3a-2), (a^2, 3a+2)\}$

$a^2=3a-2 \Rightarrow a^2-3a+2=0 \rightarrow \begin{cases} a=1 \text{ (X)} \\ a=2 \text{ (✓)} \end{cases}$

$$\text{if } \rightarrow m=1 \Rightarrow m^2-1 = a \cdot m + b \Rightarrow a+b=0 \Rightarrow a=-b$$

$$\text{if } \rightarrow m=2 \Rightarrow a^3 = a \cdot m + b \Rightarrow 2a + b = 8 \Rightarrow a=8$$

$$\Rightarrow b=-8$$

$$\Rightarrow \boxed{a \times b = -64}$$

$$\text{if } \beta K = m \Rightarrow f(K) = 2K-3 = 4-3K$$

$$\Rightarrow 5K = 7 \Rightarrow \boxed{K = \frac{7}{5}}$$

$$\text{الف} \rightarrow y^3 - 6y = m^2 - 4m + 3 \quad \text{if } m=3 \Rightarrow \left. \begin{array}{l} y^2 - 6 = 0 \Rightarrow y = \pm \sqrt{6} \\ y = 0 \end{array} \right\} \text{تابع نیست}$$

$$\text{ب} \rightarrow \text{if } (m=2 \Rightarrow |y|=1 \Rightarrow y = \pm 1) \quad \otimes \text{تابع نیست}$$

$$\text{پ} \rightarrow \text{if } (m = \sqrt{2} \Rightarrow |y|=1 \Rightarrow y = \pm 1) \quad \otimes \text{تابع نیست}$$

$$\text{ت} \rightarrow y_1^2 = -(m^2 + 2m + 1), \quad y_1^2 + (m+1)^2 = 0 \dots$$

$$\Rightarrow y=0, m=-1 \rightarrow \text{تابع نیست} \quad (\checkmark)$$

$$\text{الف} \rightarrow \sqrt[3]{y} + m^2 = 2m - 2$$

$$\left. \begin{array}{l} \sqrt[3]{y_1} = -m_1^2 + 2m_1 - 2 \\ \sqrt[3]{y_2} = -m_2^2 + 2m_2 - 2 \end{array} \right\} \xRightarrow{\text{if } m_1 = m_2} \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1 = y_2$$

تابع است $(\checkmark)$

$$\left. \begin{array}{l} y_1^3 + 2y_1 = 5m_1 \\ y_2^3 + 2y_2 = 5m_2 \end{array} \right\} \xRightarrow{m_1 = m_2} y_1^3 + 2y_1 = y_2^3 + 2y_2 \Rightarrow (y_1^3 - y_2^3) + 2y_1 - 2y_2 = 0$$

$$\Rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + 2(y_1 - y_2) = 0 \Rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 2) = 0$$

$$\left\{ \begin{array}{l} y_1 = y_2 \Rightarrow \text{تابع است} \quad (\checkmark) \\ y_1^2 + y_1 y_2 + y_2^2 + 2 = 0 \quad \otimes \end{array} \right. \rightarrow \Delta < 0$$

$$\text{الف} \rightarrow m \sin y = y \sin m \Rightarrow \text{if } m=0 \Rightarrow \text{هر مقدار } y \text{ بران } y=0$$

$$\rightarrow 0 \times \sin y = y \times 0 \Rightarrow y \in \mathbb{R} \quad \text{تابع است}$$

$$10 \text{ ب} \rightarrow \sqrt{\frac{m}{y}} + \sqrt{\frac{y}{m}} = 2 \Rightarrow \text{تابع نیست} \quad m=y \neq 0$$

$$\Rightarrow \text{تابع است} \quad (\checkmark)$$